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BLISTER PACKAGE ~~ARRANGEMENT~~

The invention relates to a blister package arrangement per the overall concept of Patent Claim 1.

Blister packages of the type containing tablets in provided pockets are well known. For this, electrical conductors usually extend across the surface of a sealing film sealing the pockets over the area of the pockets so that they are broken when a tablet is removed from the pocket of the blister package. A blister package arrangement of this type includes a receiver device for the blister package having an electronic unit that senses the break in the circuit and stores this detection of the removal of the medication. Such a blister package arrangement is known, for example, from EP 0 180 073 A1.

It is the principal object of the invention to configure a blister package arrangement for a blister package whose sealing film does not include individual conductors such that simple removal of a tablet from a pocket of the blister package and a simultaneous separation of the individual conductor of a conductor carrier strip assigned to each pocket is ensured.

This object is achieved by blister package arrangement with the properties of Patent Claim 1.

The essential advantage of the invention is the fact that those areas of the conductor carrier strip assigned to one of the blister packages that cover the pockets of a blister package, and over which the individual conductors extend, are each separated from the conductor carrier strip by a ring-shaped stamped line surrounding the pocket. This ensures that the tablets may be easily removed with precise definition.

Since at least two spars are provided by means of which the area separated from the conductor carrier strip by means of the stamped line (hereafter referred to as the covering) is connected to the conductor carrier strip, an advantageous completely targeted and defined removal of the covering upon removal of the tablet from the pocket assigned to the covering and positive separation of the assigned individual conductor may be ensured. The conductor routing over the covering may advantageously be accomplished individually, independence upon the desired removal parameters, by means of the at least two spars, or by means of only one of the two spars, whereby it is ensured that the individual conductor is broken when its tablet is removed.

Further advantageous embodiments of the invention are derived from the Dependent Claims. The illustrations show:

Figure 1 is a schematic view of a known blister package;

Figure 1a shows a cross-section through a conductor carrier strip that, with the help of an adhesive layer, is to be adhered to the blister package of the type shown in Figure 1 to produce the blister package;

Figure 2 is a view of the blister package of Figure 1 from the direction of the deep-drawing film;

Figure 3 is a view of the side of the conductor carrier strip facing the blister package arrangement of Figures 1 and 2;

Figure 4 is a view of the conductor carrier strip as in Figure 3, whereby a blister package as in Figure 2 is connected with the conductor carrier strip;

Figure 5 is a view of the side of the conductor carrier strip facing away from the blister package;

Figure 6 shows a conductor carrier strip as in Figure 5 with a protective layer covering the conductors;

Figure 7 shows a blister package arrangement inserted into a receiver device surrounding the electronic components;

Figure 8 is a view of the side of the conductor carrier strip facing away from the blister package, whereby three different types of spar configurations and conductor routings are shown for the sake of explanation;

Figure 9 is an embodiment in which the stamped line separating the covering includes spars on the two opposing sides extending longitudinally along the covering, whereby the individual conductor extends over both spar pieces;

Figure 10 is an embodiment in which the spar is positioned on one end of the covering as seen along the longitudinal direction of the covering and an additional spar is positioned approximately in the center of an area extending longitudinally along the stamped line, whereby the individual conductor extends over both spars;

Figure 11 shows another embodiment in which the spars are positioned similarly to those in Figure 10, but the individual conductor extends as a loop over the one or the other spar;

Figures 12 ~ 16 show a conductor carrier strip configured as a book-type carrier device; and

Figure 17a ~ 17e illustrate an expanded embodiment of the invention.

The following considerations led to the invention: In a known, conventional blister package that does not include individual conductors extending through the areas of the sealing film over the pockets, when a conductor carrier strip with coverings for the above-mentioned areas of the sealing film is to be provided, whereby the individual conductors extend over the coverings, it must be ensured that, during conventional removal of a tablet from a pocket by opening the area of the sealing film of the blister package, the covering positioned over the area of the conductor carrier strip is separated from the conductor carrier strip simultaneously, and also cleanly and simply. Only then is simple, clean tablet removal ensured. In this connection, the thought first arose to separate the covering from the remaining area of the conductor carrier strip by means of a stamped line, that the covering may be simply separated from the conductor carrier strip by pressure from the pocket side onto the tablet, and from the tablet onto the sealing film and the covering. If one provides such a covering separated from the conductor carrier strip by a stamped line, it must be ensured that: (1) conductor routing from the conductor carrier strip is possible via the covering, and (2) when separating the covering upon removal of a tablet it is ensured that the individual conductor is broken. For this purpose, it is proposed by the invention to connect the covering with the conductor carrier strip by means

of at least two spars whereby theses spars interrupt the stamped line. For this, a minimum of two spars are to be positioned along the extent of the ring-shaped stamped line so that, upon tablet removal, at least one of the spars is broken in any case. Upon separation of precisely this spar, the individual conductor assigned to this pocket must also be broken and electrically interrupted.

Figures 1 and 2 show a known blister package 1, whereby Figure 2 shows a top view of the blister package 1 on the side of the deep-drawing film 14 and Figure 1 shows a side view of the blister package 1. The individual bins or pockets to contain the medication or tablets are designated with 3.

Per Figure 1a, a conductor carrier strip 10 to be connected to the blister package 1 includes an adhesive layer 11 on the side facing toward the blister package 1 which adheres the conductor carrier strip 10 to the blister package 1 and possesses connection points 51, 54 of an interface 5 on the side facing away from the blister package 1. Such connection points become electrically connected when the conductor carrier strip 10 is inserted into a receiver device 40 with an electronic unit (not shown) positioned within the receiver device 40. This receiver device 40 is shown in Figure 7. In a known manner, an individual conductor 52 extends from each individual connection point 51

along the surface of the conductor carrier strip 10 over a pocket 3 containing a tablet 2 when the blister package is mounted to a common conductor 53 which, in turn, is connected via a common connection point 54 to the interface 5. A display to show the data pertaining to the tablet removal is designated with 45.

An opening 4 of the conductor carrier strip 10 is assigned to each pocket 3 of the blister package 1, whereby the exertion of pressure against the pocket 3 containing the tablet 2 required to remove the tablet separates the sealing film 13 and forces the tablet through the opening 4 of the conductor carrier strip 10. Figure 3 shows the conductor carrier strip 10 seen from the side facing the blister package 1, whereby the blister package 1 is not yet mounted or secured on the conductor carrier strip 10. Figure 4 shows a corresponding view of the conductor carrier strip 10, whereby the blister package 1 is already connected with the conductor carrier strip 10.

According to the invention, the opening 4 for tablet removal is formed by a ring-shaped, closed stamped line 41, positioned in the conductor carrier strip 10, which separates the surrounding area from the portion of conductor carrier strip 10 that covers the area of an assigned pocket 3 of the blister package 1. Therefore, when pressure is exerted against the conductor

carrier strip 10 during tablet removal, the corresponding covering 30 is pressed out of the conductor carrier strip 10 because of the stamped line 41 that forms the opening 4.

Figure 5 shows a view of the conductor carrier strip 10 from the side facing away from the blister package 1 connected therewith.

Figure 6 shows a protective layer 12 that may be mounted on the surface of the conductor carrier strip 10 facing away from the blister package 1 covering at least the outer surface of the individual conductors 52 and the common conductor 53 to protect them. The connection points 51, 54 of the interface 5 are recessed in order to allow positive contact with the receiver device 40.

According to the invention, the coverings 30 are each connected by means of at least two spars 42, 43 to the conductor carrier strip 10, whereby each spar 42, 43 represents an interruption of the stamped line 41, as is particularly visible in Figure 3.

The spars 42, 43 are so distributed about the circumference of the stamped line 41 in such a manner that tablet removal is only possible if at least one spar 42 or 43 is broken, and the covering 30 is pressed up out of the plane of the conductor

carrier strip 10, whereby the spar 43 or 42 that is not broken may serve as a piano hinge when the covering 30 is pivoted.

Figures 9 through 11 show various preferred and particularly advantageous configurations of the spars 42, 43 along the stamped line 41. Per Figure 9, the spars 42, 43 are arranged along the direction of the longer extension (longitudinal direction) opposite the covering 30 along the stamped line 41 so that tablet removal causes at least one of these spars, or both spars, to be broken. In this case, the individual conductor 52 extends longitudinally along the covering 30 and over the spars 42 and 43. The individual conductor 52 preferably extends along the longitudinal centerline L of the covering 30.

Per Figure 10, one spar is on the end of the covering 30 as seen along the longitudinal direction of covering 30, and an additional spar 42 is positioned approximately in the center of an area of the stamped line 41 extending longitudinally, whereby the individual conductor 52 extends over both spars 42, 43. For this, the first spar 43 is positioned preferably outside the longitudinal centerline L of the covering 30. The other spar 42 is preferably located on the side of the longitudinal centerline L facing away from the other spar 43, specifically outside the cross centerline Q of the covering 30. The individual conductor 52 may extend over the covering 30 in any manner.

Per Figure 11, the first spar 43 is again on one end of the stamped line 41 as seen along the longitudinal centerline L. The other spar 42 is relatively wide, and is located approximately along the axis of the cross centerline Q. The individual conductor 52 extends over the spar 42 onto the covering 30 as seen from the conductor carrier strip 10, forms a loop there, and then extends back from the covering 30 via the spar 42 to the conductor carrier strip 10. Upon tablet removal, the covering 30 is so opened that in any case the spar 42 and the conductor 52 extending over it are broken.

Figure 8 shows an example of all three embodiments in Figures 9 through 11 in a sample conductor including the individual conductor 52, the common conductor 53, and the connection points 51, 54 of the interface 5.

Figures 12 through 16 show a book-shaped carrier strip 60 in which the conductor carrier strip 10 may be folded toward a second part 63 along a fold line 61 as a first part equivalent to the covering, said first part being connected to the conductor carrier strip 10. In the second part 63, insertion openings 62 are positioned that are directed toward the stamped line 41 when the parts 10 and 63 are folded together like a book along the fold line 61. To produce this blister package configuration 10, a blister package 1 is so positioned on the

second part 63 that its pockets 3 engage with the insertion openings 62 of the part 63, whereby simultaneously the blister package 1 is directed in the necessary manner toward part 63, and also toward the conductor carrier strip 10. Subsequently, parts 10 and 63 are folded together like a book along the fold line 61 and connected together, preferably by an adhesive. The blister package 1 is thus located in exactly the correct position between parts 10 and 63. The parts 10 and 63 are thereby of such dimensions that they project over the blister package 1 on all sides, whereby the projecting edge areas of parts 10 and 63 are firmly adhered to each other so that separation and removal of the blister package 1 is not possible.

A comment here can be made that instead of several individual insertion openings 62, a single insertion opening 62' may be provided that can receive all pockets of the blister package 1 simultaneously.

Figures 12 through 14 show views of the carrier strip 60 from within, whereby per Figure 13 the blister package 1 is inserted straight, and per Figure 14, it has already been inserted. Figure 15 shows the part 63 with the inserted blister package 1 from without, and Figure 16 shows a view of the carrier strip 10 from without.

In the following, an additional preferred embodiment of the invention will be described with reference to Figures 17a through 17c. Details from Figures 17a through 17c that have already been explained using the previous Figures are designated in a corresponding manner, whereby an apostrophe (') is appended to the pertinent reference numerals.

Figure 17b shows a conductor carrier strip 10' that includes the individual connection points 51', the individual conductors 52', the common conductor 53', and the common connection point on the side facing toward the blister package 1' (Figure 17a). An electrically insulating dielectric layer 64' is positioned on the side of the conductor carrier strip 10' facing toward the blister package 1' that covers the individual conductors 52' and the common conductor 53' at least in the area in which, per Figure 17c, the blister package 1' is preferably mounted by adhesion of the sealing film 13' to the dielectric layer 64'.

Figures 17d and 17e show a modification of the conductor carrier strip 10' in which an adhesive layer 66' is mounted on the dielectric layer 64' that is covered by a tear film 65'. The tear film 65' preferably extends per Figure 17d along a side over the adhesive layer 66' so that an area is formed that may be manually gripped in order to remove the tear film 65' from the adhesive layer 66'. After removal of the tear film 66', the

exposed adhesive layer 66′ may be connected with the blister package 1 by pressing against the sealing film 13′ of the blister package 1′.

It is also conceivable to form the electrically insulating layer 64′ simultaneously as a adhesive layer so that it may be directly adhered to the sealing film 13′.

Comment must be made that the preferred embodiments of the carrier strips 10′ shown in Figures 17b through 17e may be a component of the book-type carrier strip described in connection with Figures 12 through 16.

Reference Index List

1, 1′ Blister package

2, 2′ Tablet

3, 3′ Pocket

4 Opening

5 Interface

10, Conductor carrier strip

10'

11 Adhesive layer

12 Protective layer

13, Sealing film

13'

14 Deep-drawing film

30 Covering

40 Receiver device

41 Stamped line

42 Spar

43 Spar

45 Display

51, Individual connection

51' contact spot

52, Individual conductor

52'

53 Common conductor

54 Common connection

contact spot

60 Carrier strip

61 Fold line

62, Insertion openings

62'

63 Part

64' Dielectric layer

65' Tear film

66' Adhesive layer

L Longitudinal centerline

O Cross centerline